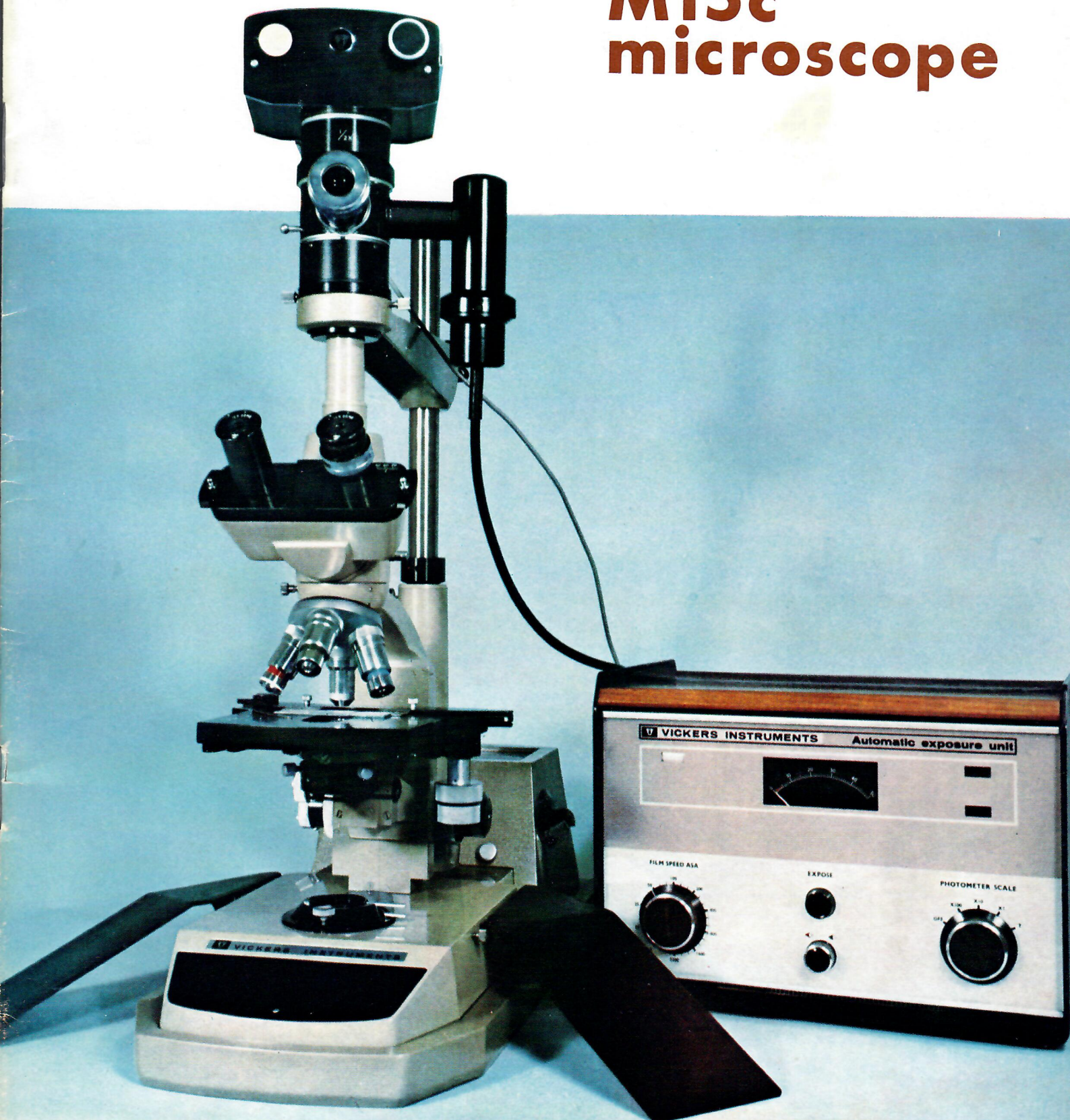


VICKERS
M15c
microscope



VICKERS

M15c microscope

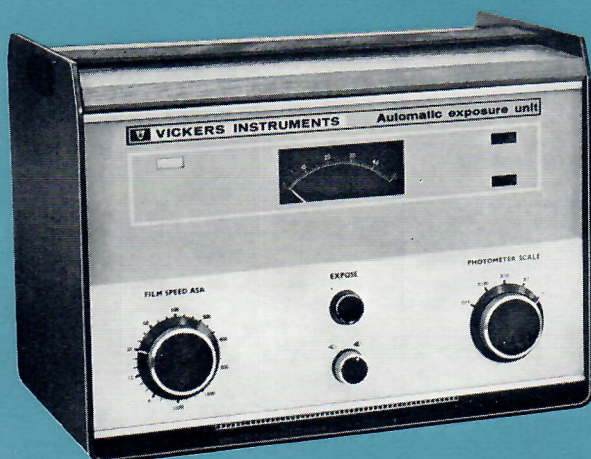
The M15c microscope has been developed from the Vickers performance proven M15 microscope range, being both a student microscope in its simpler form, and a laboratory instrument with research capabilities when fitted with more sophisticated accessories.

STURDY RESEARCH STAND

Excellent stand rigidity has been obtained by the use of a large box base fitted with ball-bearing stage focusing slides of unusual width and length, positioned close to the optical axis.

UNEXCELLED OPTICAL PERFORMANCE

A wide range of flat-field microplan objectives are available together with fluorite and achromat systems, which when combined with phase contrast facilities and a magnification changer, provide an optical capability and versatility beyond that normally offered with most other microscope stands.



SUPERIOR EASE OF OPERATION

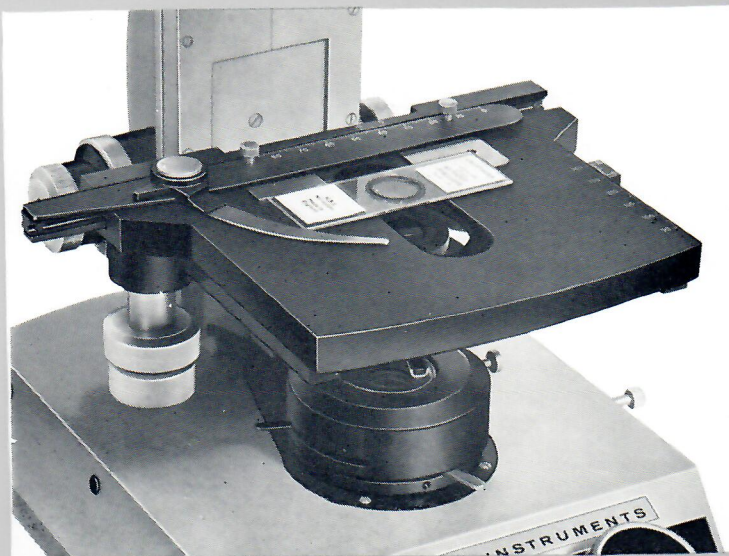
All the controls, which are kept to an absolute minimum, are placed conveniently to hand. The provision of pendant traverse controls, built in illumination adjustment, and arm-rests allows for even greater comfort.

THE M15c CAN GROW WITH YOUR NEEDS

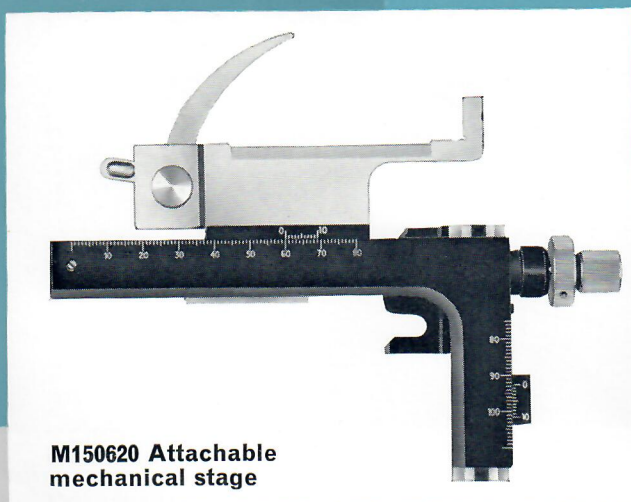
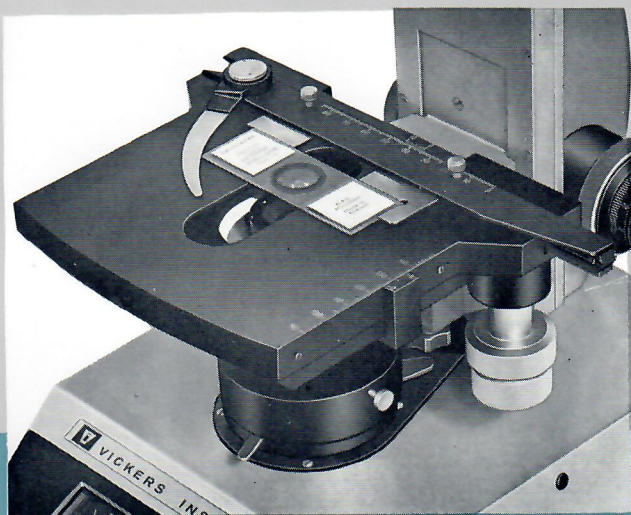
The construction of the M15c allows many additional accessories to be added as and when required. Projection facilities, camera equipment, ultra-violet and blue-light fluorescence accessories expand the instrument to cope with almost all normal research requirements.



**M15c microscope on camera stand
with manual 35mm camera and
cadmium sulphide photometer**



The large mechanical stage may be fitted for right or left handed use



M150620 Attachable mechanical stage

STAGES

The stand of the M15c is available either fitted with a pendant control square mechanical stage for routine and research use, or with a plain stage for use as a student microscope.

The square mechanical stage provided with cross verniers has a very large working surface and can be supplied fitted for right-handed (M151840) or left-handed (M151880) use. The stage verniers have a cross movement of 50×75 mm., the slide carrier itself being removable.

The plain stage for students can be fitted with an attachable mechanical stage (M150620) with cross verniers, thereby widening its range of application.

MAGNIFICATION CHANGER

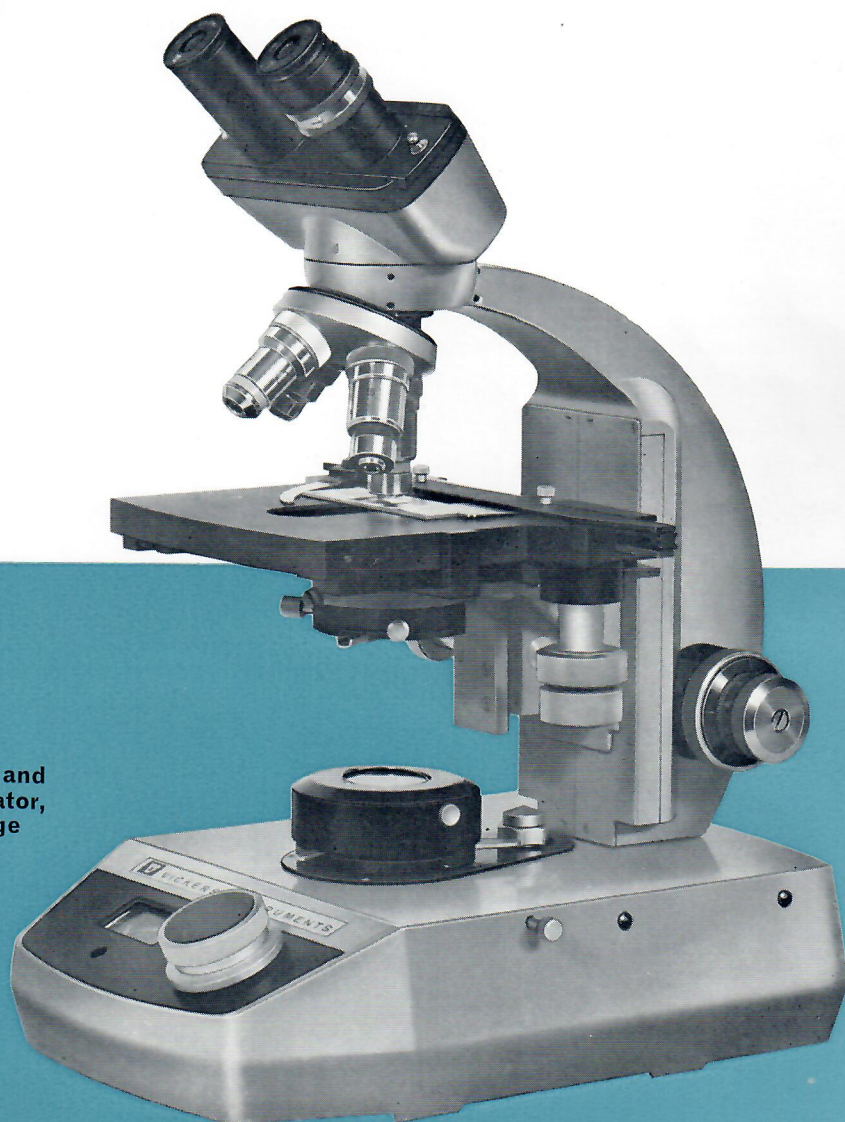
Both the student and research versions of the M15c can be fitted with a magnification changer. The changer drum contains three lens systems with magnification factors of $1\times$, $1.5\times$ and $2.25\times$, each of which can be rotated into the optical path affording a ready range of magnification without need of eyepiece or objective change. A final position contains a focusable Bertrand lens for examining the back focal plane of the objective when setting up phase contrast and for critical bright field work.



M220130 Magnification changer

WIDE FIELD ILLUMINATION BASE FOR THE M15c MICROSCOPE

The M15c microscope (M151287) with the wide field 6 volt 30 watt illumination base is the ideal choice for the routine or research laboratory. The 6 volt 30 watt lamp provides sufficient high intensity illumination for photographic purposes and for use with the projection head under most circumstances. The illumination is suited to high or low power conditions when used with the achromatic condenser M151950 by the operation of a single control. The aperture of an oil immersion objective may be fully filled and the field of a low power objective fully covered without change of condenser or top lens. A substage auxiliary lens widens further the field to cover a $3\times$ objective.



M15c microscope equipped for routine and research work with the Köhler illuminator, binocular head and large mechanical stage

ILLUMINATION

A number of different illumination systems are available to suit almost all possible applications.

The mains illuminator (M151392) is suitable for monocular student use.

The low voltage 6 volt 15 watt illuminator (M151395) with a rheostat and transformer housed within the base is suitable for student binocular work and for phase contrast.

More exact intensity control is achieved with the low voltage 6 volt 15 watt illuminator (M151590) which has a rheostat, transformer and voltmeter housed within the base.

The Köhler type 6 volt 15 watt illuminator (M151394) with a rheostat, transformer and voltmeter within the base provides precise and convenient control of the illumination for all routine and research applications where light is not an absolute premium.

The wide field 6 volt 30 watt illumination base with a rheostat, transformer and voltmeter housed within the base provides high intensity full field and full aperture illumination from the lowest to the highest power objectives. Changeover from high power to low power illumination conditions is effected by the operation of a single control. The brightness is ample for most photographic and projection head work.

The mirror in a gimbal (M151391) is for use with any free-standing external illuminators.

Should the instrument be required for projection purposes or high power photographic work a special illumination base (M151410) would be advised.



M151391



M151392



M151394



M151590

INTERCHANGEABLE VIEWING HEADS

A wide range of interchangeable heads are available to suit almost all possible applications.

M150325 is an inclined monocular head—intended for student work or where light is at a premium.

M150215 is an inclined binocular head—for use on advanced student or research outfits.

M150870 is a straight monocular head—to be used with photographic attachments or the 6" viewing screen.

M252704 is a monocular photo-visual head—which contains a beam-splitting prism reflecting approximately 20% of the light to the viewing head and 80% to the camera.

M252723 is a binocular photo-visual head—containing a beam-splitter for simultaneous photographic and binocular visual work. The prism splits the light in the proportions 20% to the viewing head and 80% to the camera. The head has a $1.3\times$ factor.

M150855 is a photo-visual trip mirror unit—to be used in conjunction with the straight monocular head and either the inclined monocular head or inclined binocular head. A trip mirror sends all the light either to the straight tube or the inclined tube. The unit has a magnification factor of $1.6\times$.



M150870



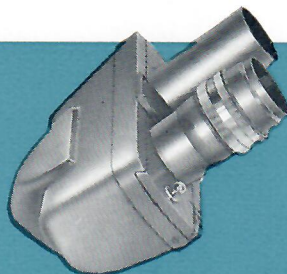
M252704



M150325



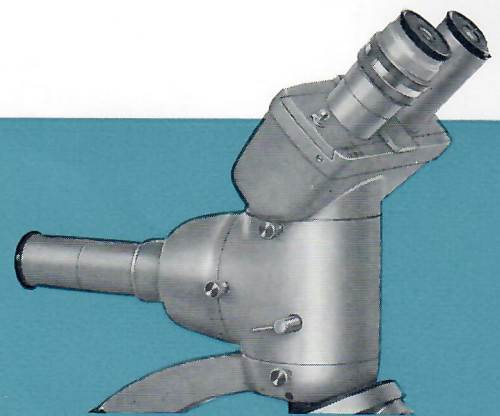
M252723



M150215



M150855 Set up as photo-visual unit with M150870 and M150215



M150855 Set up as projection unit with M150870 and M150215

THE TUNGSTEN HALOGEN ILLUMINATION BASE

Very high intensity illumination is available from the tungsten halogen 12 volt 100 watt lamp fitted to the special illumination base. An intensity control is provided together with facilities for sensitive and complete control of the illumination. The colour temperature is 3100°K at normal voltage rising to 3300°K at full load, enabling colour or black and white photography to be undertaken with maximum ease. A support arm can be fitted to the base to hold any of the available camera systems including automatic 35 mm. M.P.P. universal back and Polaroid roll and cut film backs.



Automatic photomicrography with the CB100 Polaroid cut film camera back is readily undertaken on the M15c research microscope



The unique 6" diameter micro-crystalline wax viewing screen can be fitted to the head of the instrument providing a swivelling well-illuminated projection surface. Horizontal and vertical projected images of good brightness can also be produced using the appropriate accessories.

Blue light fluorescence work can be undertaken with the tungsten halogen base if a suitable pair of exciter and barrier filters is used. The details are quoted at the end of the specification.

Full facilities are also available with a mercury vapour illumination base for ultra-violet fluorescence work.



J36 Photo timer and M15c microscope with large format camera

CONDENSERS

A number of condensers are offered covering the wide range of available objectives.

The Abbe condenser (M150715) is adequate for most students' work.

High-power work calls for the swing-out top lens condenser in either a plain mount (M150430) or centring mount (M220450) suitable with the top lens swung in. The top lens is swung out for lower-powered work.

When more exacting work is undertaken an achromatic oil immersion condenser N.A.1.3 (M150805) is necessary.

An aplanatic condenser M220263 N.A.1.0 in centring mount is available for use with the Köhler illuminator (M151394).

The achromatic condenser is designed for full utilization of the capabilities of the M151287 wide field illumination. Full low power field coverage and high power aperture filling are achieved without the use of interchangeable or swing-out top lens systems. Further field coverage down to $3\times$ power objectives is provided for by the use of an auxiliary lens in a swing-in substage mount.

STANDARD RESEARCH PHASE CONTRAST UNIT

The unit, M410975, may be used with both negative and positive phase objectives. Three revolver mounted phase annuli cover the full range of phase contrast objectives. A fourth position is intended for bright field work with the condenser aperture iris. A final free aperture is reserved for further accessories. The annuli are centred to the objective rings by operating a pair of captive sprung pins which retract from the annuli mounts after centration. All the rings may thus be accurately centred and cannot then be disturbed by inadvertent operation of the pins.

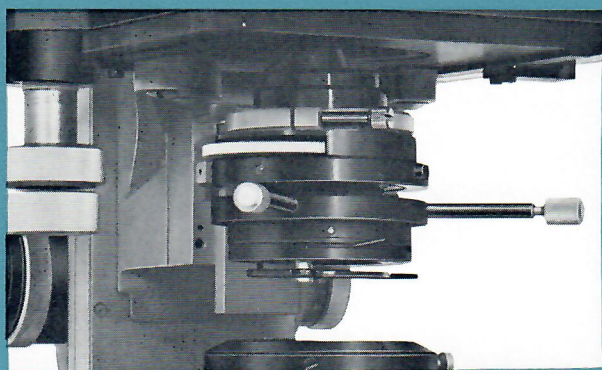
STUDENT PHASE CONTRAST UNITS

Two condenser units are available. M151650 is provided with a three annulus slider matched for $10\times$, $40\times$ and $100\times$ objectives. The slider can be removed for bright field work.

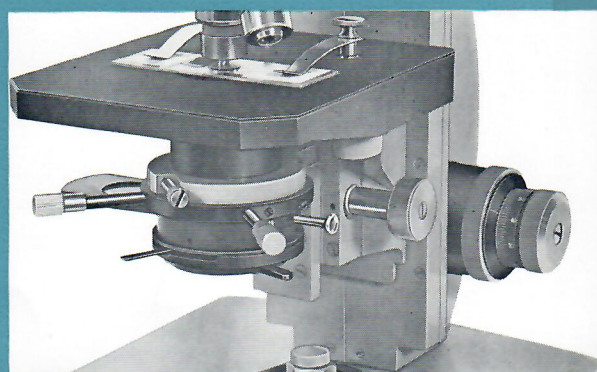
M151660 has a two annulus slider fitted with annuli for $10\times$ and $40\times$ objectives. A further clear aperture is provided for bright field work.

OBJECTIVES

A wide range of objectives are available catering for the needs of simple student microscopes and for the more sophisticated requirements of high grade research work.



Research phase contrast unit



Student phase contrast unit

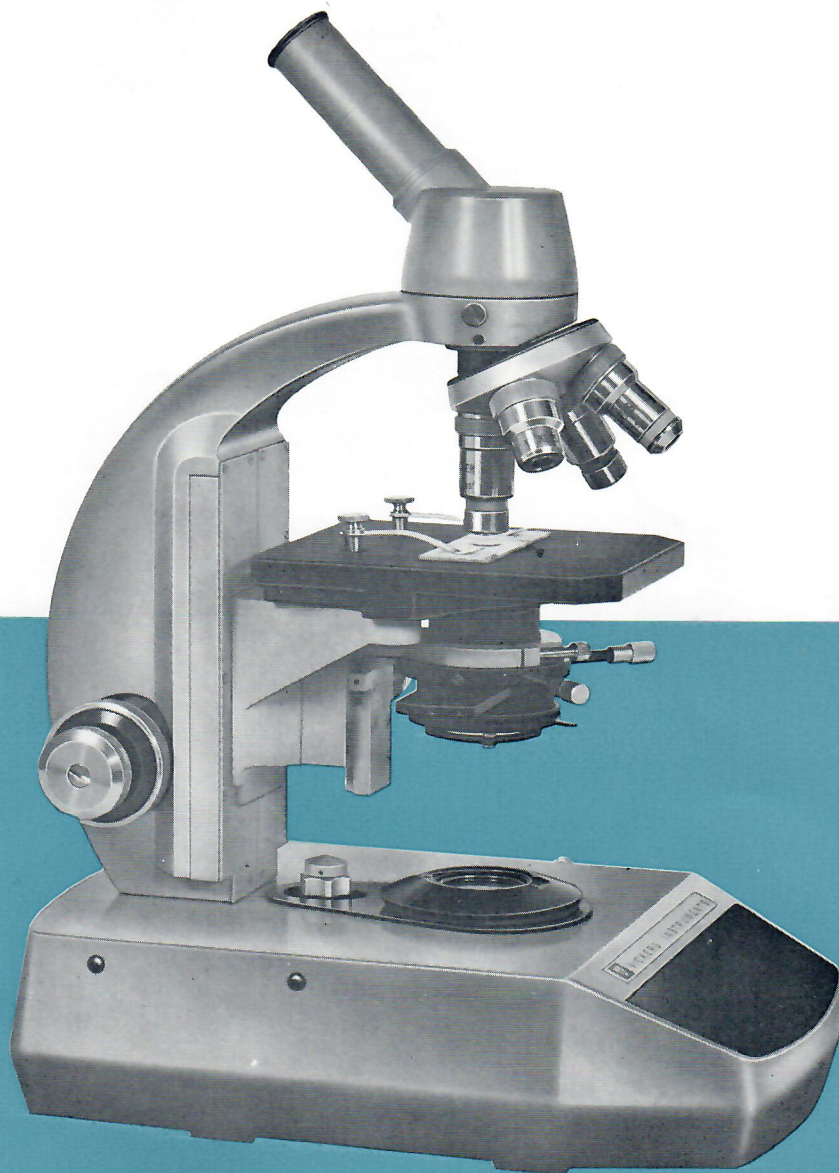
OBJECTIVES (contd.)

Four basic objective types are offered:

The achromats—being simply corrected objectives for student and routine work. The microplans—objectives with achromatic correction but with edge to edge flatness of field without re-focusing. The fluorites—these are systems with somewhat better colour correction and enhanced apertures. The apochromats—which are objectives with maximum aperture and colour correction, should be employed when optimum performance is required. Many of the objectives are also available for phase contrast work, a full range of both positive and negative objectives being offered.

EYEPIECES

Huygens eyepieces are suitable for use with the low-power achromats and compensating eyepieces are to be used with the high-power objectives. The complan eyepieces which render a flat-field and long eye clearance achieve particularly useful results with the microplan objectives.



M15c microscope fitted for student use with monocular head, simple stage, mains illuminator and student phase unit

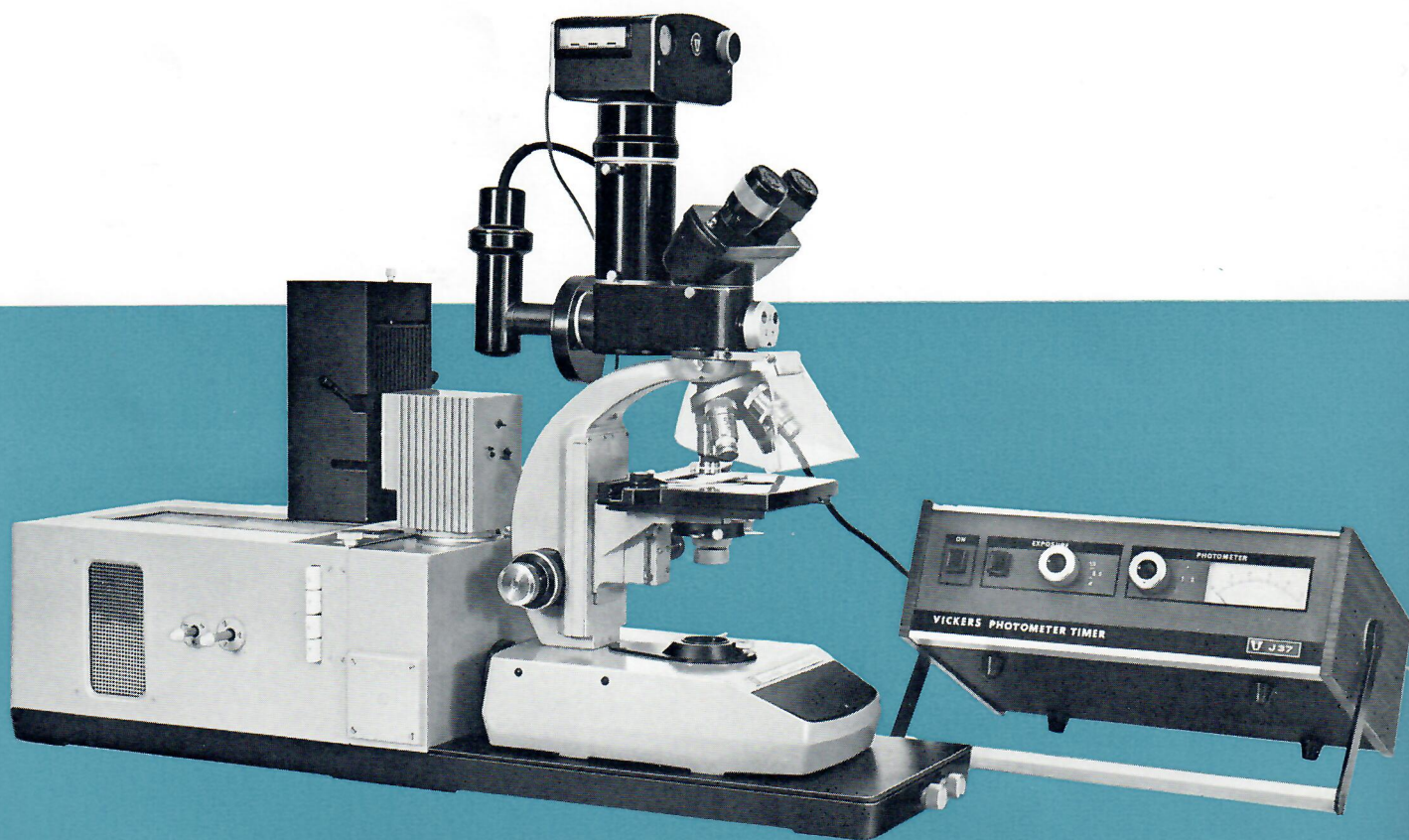
FLUORESCENCE EQUIPMENT AND PARTIAL FIELD CAMERA

A recent development for M15c is the M151810 fluorescence equipment for ultra-violet and blue light fluorescence work with the high pressure mercury vapour lamp HBO 200. A tungsten halogen 12 volt 100 watt lamp serves as an intense source of white light. The ingenious combination of a dichroic mirror and colour discriminating phase annuli makes possible the attainment of combined phase contrast fluorescence images.

The J37 high sensitivity photometer timer with its associated partial field device enables precisely controlled photography to be undertaken on even the faintest and least homogeneous dark ground fluorescence images. A stop device enables photometric measurements to be undertaken on sections of the field 1/10, 1/100 or 1/500 by area of the whole field or the whole field. The system is extremely sensitive such that it is possible to measure the amount of light present with the 1/500 stop in place when the image can only just be seen by the well dark adapted eye.

For full details see separate leaflet on M15c fluorescence equipment. Specifications are listed in the M15c microscope price list.

A full range of automatic, semi-automatic and manual camera equipment is available for the M15c. All normal camera formats from 35 mm. to 4" × 5" and Polaroid can be accommodated.



SPECIFICATIONS

M151287 M15c microscope with concentric coarse and fine focusing, ring condenser mount, rack and pinion substage, built-in mechanical stage with scales and verniers, revolving quadruple objective changer and box base fitted with built-in 6 volt, 30 watt wide field illuminator, rheostat and transformer for 240 volt supply. **This lamp unit cannot be interchanged with any of the illuminators listed below.**

M151288 As M151287 above, but for 110 volt supply.

M151321 M15c microscope with concentric coarse and fine focusing, ring condenser mount, rack and pinion substage, built-in mechanical stage with scales and verniers, revolving quadruple objective changer and box base to be equipped with any of the illuminator sets listed.

M151322 M15c microscope with concentric coarse and fine focusing, ring condenser mount, rack and pinion substage, plain stage, revolving quadruple objective changer, and box base to be equipped with any of the illuminator sets listed.

VIEWING HEADS

M150325 Inclined monocular head.

M150345 Inclined monocular head with nylon cone, allowing extra free rotation.

M150215 Inclined binocular head.

M150870 Straight monocular head for photomicrography or for projection screen use.

M150855 Photo-visual or projection trip mirror unit allowing all the light to be deflected to the eye or to a camera or projection screen. The unit is for use with the straight monocular photo head and either the inclined monocular head or inclined binocular head.

M252704 Beam splitting photo-visual inclined monocular head.

M252723 Beam splitting photo-visual inclined binocular head.

M150936 Micro projection screen.

MAGNIFICATION CHANGER

M220130 Magnification changer unit giving magnifications of 1 $\times$, 1.5 $\times$, 2.25 $\times$, with a focusing Bertrand lens.

ILLUMINATION

M151391 Plano-Concave mirror in gimbal (interchangeable with the following illuminators).

M151392 Mains voltage 25 W. illuminator with bulb 230 V.

M151393 Mains voltage 25 W. illuminator with bulb 110 V.

M151394 Köhler type illuminator with condenser field iris diaphragm, swing-in diffuser, 6 V., 15 W. bulb including built-in transformer, meter and controls (for 230 V. supply).

M151397 As M151394 but for 110 V. supply.

M151395 Low voltage illuminator with 6 V., 15 W. bulb with built-in transformer and rheostat control (for 230 V. supply).

M151398 As M151395 but for 110 V. supply.

M151590 Low voltage illuminator with 6 V., 15 W. bulb with built-in transformer, rheostat control and meter (for 230 V. supply).

M151591 As M151590 but for 110 V. supply.

M006015 Pack of ten spare bulbs, 240 V., 25 W.

M006016 Pack of ten spare bulbs, 110 V., 25 W.

M006014 Pack of three spare bulbs, 6 V., 15 W.

M006033 Pack of three spare bulbs, 6 V., 30 W.

PROJECTION BASE

M151410 Projection base for M15c microscope, with 100 W. tungsten halogen lamp, Köhler type lens condenser system, iris diaphragm, built-in transformer, meter and controls, internal mirror and gimbal (for 230 V. supply).

M030715 Short pillar and support arm, for fitting to projection base, for camera.

M151430 Projection base for M15c microscope, as M151410 but including short pillar and support arm for camera.

M151510 Projection base for M15c microscope, with 100 W. tungsten halogen lamp, Köhler type lens condenser system, iris diaphragm, built-in transformer, meter and controls, internal mirror and gimbal (for 110 V. supply).

M151511 Projection base for M15c microscope, as M151510 but including short pillar and support arm for camera.

M320545 Spare bulb, tungsten halogen lamp, 12 V., 100 W.

CONDENSERS

M150715 Abbe condenser in plain mount.

M150430 Swing-out top lens condenser in plain mount.

M220450 Swing-out top lens condenser in centring mount.

M150805 Achromatic oil immersion condenser N.A. 1.3, in centring mount.

M151950 Achromatic oil immersion condenser N.A. 1.25, in centring mount—highly recommended for use with 6 V., 30 W. wide field illuminator.

M150807 Achromatic oil immersion condenser N.A. 1.3, in centring mount, for use with M151394/7 6 V., 15 W. illuminator.

M410975 Standard research phase contrast unit.

M151650 Student phase unit for 10 $\times$, 40 $\times$ and 100 $\times$ objectives.

M151660 Student phase unit for 10 $\times$ and 40 $\times$ objectives.

M020430 *Auxiliary viewing microscope for use with M151404.

M220263 Aplanatic condenser N.A. 1.0, in centring mount, for use with Köhler illuminator.

M150810 Dark ground focusing condenser in centring mount.

**Viewing microscope is not required when M220130 magnification changer is used.*

ACCESSORIES

M150620 Attachable mechanical stage with scales and verniers to fit plain stage.

M720295 Simple polarizer.

M220185 Simple analyser.

M151384 Wood cabinet for M151322.

M151385 Fitted wood cabinet for M151321 and M151287/8.

M151324 Arm rests.

M002639 Soft plastic dust cover.

OBJECTIVES

Achromatic

	Magnification	N.A.	Working distance mm
M022011	3×	0.1	40.0
M022111	5×	0.15	17.0
M022311	10×	0.25	5.0
M022411	20×	0.50	1.19
M022511	40×	0.65	0.68
M022911	40×	0.85	0.30
M022611	100×	oil 1.30	0.15

Fluorite

M023611	50×	oil 0.95	0.21
M023511	100×	oil 1.30	0.10

Microplan

M025611	2.5×	0.08	17.0
M025111	10×	0.25	3.0
M025411	20×	0.50	0.31
M025211*	40×	0.70	0.18
M025511	100×	oil 1.25	0.15

Apochromatic

M024011	10×	0.30	3.6
M023911	20×	0.65	0.44
M023711	80×	oil 1.32	0.10

Phase Contrast Achromatic

M022318	10×	0.25	5.0
M022518	40×	0.70	0.68
M022618	100×	oil 1.30	0.15

Phase Contrast Fluorite

M023618	50×	oil 0.95	0.21
M023518	100×	oil 1.30	0.10

Microplan Phase Contrast

M025118	10×	0.25	3.0
M025218	40×	0.70	0.18
M025518	100×	oil 1.25	0.15

* Please note that when a 40× objective is required for use with a counting chamber, M025211 objective, due to insufficient working distance, is not suitable. The 40× achromatic objective M022511 is recommended for this purpose.

EYEPIECES

Huygens

		Field of View	No.
M040100	6×	Single	18
M040700	8×	Single	18
M040301	10×	Single	18
M040120	6×	Pair	18
M040720	8×	Pair	18
M040321	10×	Pair	18

Compensating

M041100	6×	Single	17
M041700	8×	Single	15
M041602	20×	Single	8.5
	focusing		
M041120	6×	Pair	17
M041720	8×	Pair	15
M041622	20×	Pair	8.5
	focusing		

Complan Wide Field Compensating Eyepieces with long eyepoint

M041301	10×	Single	18
M041321	10×	Pair	18

Wide Field Compensating

M041312	10×	Single	18
M041912	12½×	Single	17
M041812	16×	Single	14
M041612	20×	Single	11
M041332	10×	Pair	18
M041932	12½×	Pair	17
M041832	16×	Pair	14
M041632	20×	Pair	11

Kellner Focusing Eyepieces

M042302	10×	Single	16
M042322	10×	Paired	16

Eyepiece Graticules (0.75 in. dia.)

M047020	1 cm divided into 100 parts
M047010	Crosslines

Filters for Blue Light Fluorescence for use with the Tungsten Halogen Lamp

M151541	Barrier filter—to fit eyepieces 0.75 dia.
M151542	Primary filter—32 mm. dia. (5 mm. BG12).



VICKERS LTD.

VICKERS INSTRUMENTS

HAXBY ROAD
YORK, YO3 7SD

Telephone: York 09-04 24112
Telegrams: Coordinate York



PURLEY WAY
CROYDON, CR9 4HN

Telephone: Croydon 01-688 3845
Telegrams: Optivorum Croydon